The Gold Coast: Suvannabhumi? *Lower Myanmar Walled Sites of the First Millennium* A.D.

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UPPER AND LOWER MYANMAR

MYANMAR (28°31′ TO 9°58′N) IS CLOSER TO SOUTH ASIA than any other country in Southeast Asia. It is about twice as long north to south (2051 km) as it is east to west (936 km), having borders with Bangladesh, China, Thailand, India, and Laos (Fig. 1). The principal river, the Ayeyarwaddy (Irrawaddy) River, crosses its length from north to south. Indicators of the river's importance are the commonly used terms of "Upper" (Anya) or upstream for areas north of about 18°N near Pyay (Prome) and "Lower" or downstream for the delta and peninsula. In use from at least the Bagan period (eleventh to thirteen centuries A.D.), the names are complementary in both concept and physical reality (Aung Thwin 2005:317). The geography of Myanmar as a whole is oriented north to south, with mountains paralleling the four main rivers: the Ayeyarwaddy (1130 km), Chindwin (644 km), and the Thanlwin (Salween, 241 km in the valley south of the Shan Plateau). This last river continues into the south, paralleled on the west by the Sittaung (322 km). The peninsula of Lower Myanmar faces the Bay of Bengal and the Indian Ocean, long facilitating interchange with Bangladesh, India, and Sri Lanka. The Ayeyarwaddy rises in the far north above Myitkina at the Mehkha and Malika River junction. It soon opens out into the wide plains of the central basin; west of Mandalay it is joined by the Chindwin. To the south, it branches out to empty into the Gulf of Muttama (Martaban). Several well-used early trade and military routes between India and China passed through Upper Myanmar, including a road west up the Chindwin River through Manipur (Taw Sein Ko 1913:329–330).

Within Upper Myanmar, the most dominant ecological factor is aridity. This increases as one moves north, seen in the annual precipitation figures for the first millennium A.D. walled sites of Sriksetra, Beikthano, and Halin. Located approximately 18°, 20°, and 22°N respectively, these sites average 1250 mm, 870 mm,

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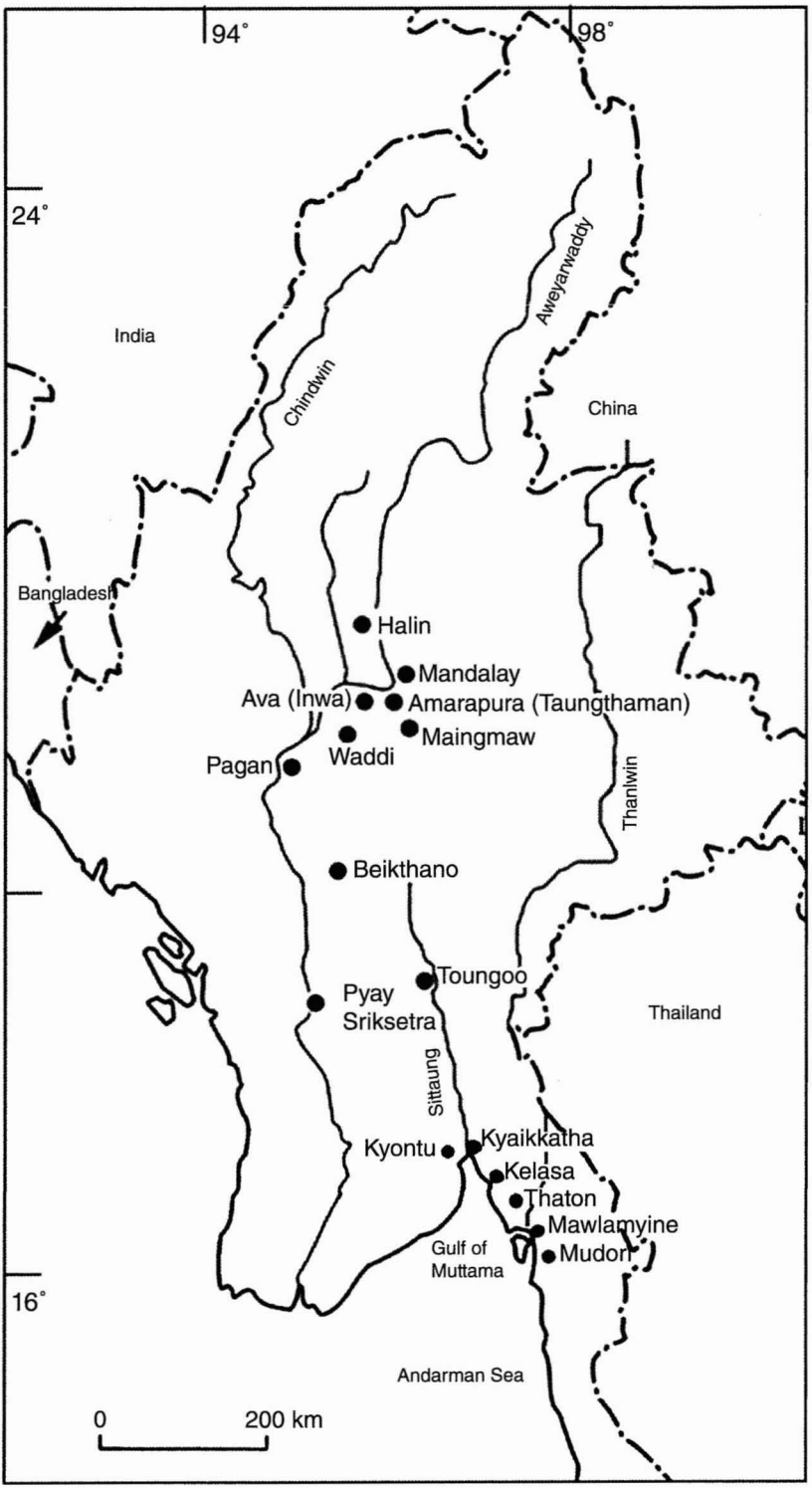

Fig. 1. Map of Myanmar with places referred to in text.

and 750 mm rainfall per annum, with Sriksetra considered to lie in a transition zone between dry inland Anya and the wet coastal areas of Lower Myanmar. In contrast, at Thaton in Lower Myanmar, there is some 5000 mm of rainfall per year. Of this, 4000 mm falls during June, July, and August, with little or no rain from November to April (Thaton District Gazetteer 1907:11; Tin Gyi 1931:44). In Lower Myanmar, there is an additional problem of flooding from salt water, with preventive bunds constructed along the coast. Salt was probably harvested during the first millennium A.D., as it is today, but despite good evidence of its importance in Iron Age expansion in northeastern Thailand, we lack comparable documentation in Lower Myanmar (Higham 2002:194, 226). However, it is not just the salt water that threatens crops. For example, during August and September, small marine crabs infest the paddy fields. A number of strains of rice are planted, with some varieties able to resist the effects of salt. Dry-season water management includes damming small hill streams, channeling tidal creeks, and using a baling system with bamboo tripod and baler *(khanwe)* attributed to the Karen (Tin Gyi 1931:47, 52). Reflecting the multiple purposes of moat construction, the Myanmar distinguish three kinds: water moats *(ye kyone),* dry moats *(chauk kyone),* and mud moats *(nyun kyone).*

Three administrative districts—Bago (Pegu) Division, Mon State, and Tanintharyi (Tennassserim) Division—are found today along the 800 km southern coast. The sites we describe in this essay lie within 100 km of each other in a relatively small area (16.50–17.25°N,96–97.25°E) between the Sittaung and Thanlwin Rivers at the northern end of this coast. South of Tanintharyi Division is the border with Thailand, with Malaysia making up the southern part of the c. 1800 km–long peninsula. In general, the eastern side of the peninsula has much wider coastal plains than the western face, although the part we report on here sits within an area of lower land, some 20,000 km^2 of terrain below 300 m in the pocket of floodplain around the egress of the Thanlwin. The narrowest part of the peninsula, the so-called Isthmus of Kra, falls within Thailand, with a number of first millennium A.D. ports located along this portion of the coast. The concentration of sites has long been used to support the existence of a transpeninsular trade route over the isthmus, although Jacq-Hergoualc'h cites factors such as the sharp relief, difficult to navigate rivers, and dangerous fauna to argue instead in favor of a circumpeninsular route (1997:123).

In our view, coastal and overland routes may have reciprocated each other. Within Lower Myanmar, the geography of the immediate coast and inland areas also balanced one another, for while both fall within the same broad type of ecology, each offered its own economic and trading opportunities as well as rhythms of time (Gommans 2002:4). Our perception of these sequences stems from the present, and while the environment remains broadly consistent, the course of many rivers *(myit)* and streams *(chaung)* changed, sometimes notably even within the past century. For example, in 1911, the Sittaung cut across a long bend northwest of Kyaikto to make a new channel. This prompted erosion on the eastern Kyaikkatha and Kyaikto area and additional sedimentation on the Bago side (Chhibber 1933:32). These changes affected cultivation as well as trade, for Lower Myanmar is not exclusively given over to trade. Nai Pan Hla, while not giving specifics, refers in passing to the Lower Myanmar plain (117,000 km^2) being equal in size to the Dvaravati Plain of central Thailand (143,000 km^2) (1992:9–10).

Rice-growing land is seen today around the sites of Kyaikkatha, Kelasa, and Thaton. Kyaikkatha (17°21′N,96°55′E) and Thaton (16°56′N,97°22′E) are roughly equidistant from Kelasa (17°14′N,97°05′E). Together they describe a northwest to southeast line c. 100 km in length facing the northeast coast of the Gulf of Muttama. Streams such as the Kalun north of Kyaikkatha, the Theh Pyuu ("white sand") south of Winka, and the Ye-poat (*bauk,* "putrid water") north of Thaton all continue to play important but changing roles in these areas.

LATERITE, WATER, AND SITE RAMPARTS

Lower Myanmar has extensive tracts of laterite, an iron-rich precipitate that can be several centimeters to over a meter in depth. These may be visible at ground level or below the ground surface. Pendleton noted that the placement of the illuvial laterite horizon is conditioned by the upper surface of the groundwater, which needs to be close enough to the ground level for the solution to oxidize. In the formation process, this positioning of the water table is more critical than the rainfall regime (1941:202). In the Thaton area, the red-yellow lateritic soils, poor in fertility, are found as a clay layer some 10 cm below the surface (Tin Gyi 1931:52). Soft when dug, laterite hardens upon exposure to form an extremely robust building material. In Bangladesh, lateritic clays are commonly used to make blocks and mortar, with their availability and durability well known (Rahman 2000:218–220). In Lower Myanmar, it is possible that ramparts were initially built with laterite blocks and later augmented by clay bricks (Nai Pan Hla 1992:50).

Laterite *(gawun)* was used extensively in Lower Myanmar for stupa foundations and entryway reliefs. Remains of laterite wall and stupa constructions often contain sizeable pieces, seen for instance in the laterite stupa of Kumara/Rajamuni Zeidi in Winka and nearby in blocks some 60 cm in length at Zothoke (Kyaikhtisaung) stupa and the site's Hsindat-Myindat wall remnant (100 m long and c. 2.25 m in height) (Fig. 2). The face of this wall has been carved with large figures of elephants and lions (Aung Thaw 1972:40; Luce 1985:161–162, Pl. 70–71; Tin Gyi 1931:28). The name, meaning "elephant and horses," may recall carvings on the other wall sectors that once enclosed the now-separate parts of the site, which we describe below. The Zothoke (Kyaikhtisaung) carvings are akin to those found at Dong Si Mahasot and Dong Lakhon, Prachinburi, in central Thailand. There, reliefs on the walls of a tank depicting lions, elephants, and *makara* (sea monsters) have been dated to c. the sixth century A.D., while a pair of footprints (3.5 m in length) of the Buddha are placed in the eighth century A.D. (Woodward 2003:55).

Laterite is thought to have been exploited not only as a building material but for its high iron content. We know little of Iron Age developments in the Mon State; in northeastern Thailand, however, Iron Age artifacts of the first millennium A.D. have been used to support a profile of agricultural intensification, including the advent of plowing and double cropping. Northeastern Thailand is also a laterite-rich region, where it is thought to have been an important element in the increasing availability of iron implements in the early centuries A.D. (Higham and Thosarat 1998:135). In a study of iron smelting in Gujarat, no laterite mining was observed, although such mining is considerable in Lower

Fig. 2. Hsindat-Myindat wall remnant, southeast sector, Zothoke (Kyaikhtisaung).

Myanmar north of both Kyaikkatha and Thaton. However, Hegde did note the collection of limonite rocks from the surface of the basal laterite formations and the presence of porous, deep to light red lumps of hematite and limonite (1973:417). When roasted, the limonite—lighter red to yellow depending on hydration—expels its water content and increases the iron oxide content, making it more porous and easier to crush, thus rendering it suitable for reduction. In tests on slag obtained from this material, considerable iron was found to have been lost in the slag, which would have been smelted at a minimum reduction temperature of c. 1100° to 1200° C.

The extraction of the metal is thought to have been done directly in a primitive furnace without any fluxing of the ore; although highly wasteful in relation to the total weight of ore smelted, tests of current Gujarat samples showed a very pure iron content. Comparison of these to Iron Age pieces and sites underlines similar production methods (Hegde 1973:418–421). At present, there has been no technical analysis done of iron artifacts and slag recovered from Kyaikkatha. However, studies such as these in India and northeastern Thailand encourage us to further investigate early use of the abundant laterite formations for iron production in Lower Myanmar. Also pertinent in light of the low firing seen at the Gujarat sites are iron artifacts excavated from graves at Taungthaman near Mandalay. Tests on these pieces suggested that they were produced at the minimum temperature threshold needed for iron, as they contained a number of impurities that would have been smelted out with higher heat and greater control of the process (Stargardt 1990:28).

Fig. 3. Laterite cells at Mu-hsoe-ma-gu, northeast side Kyaikkatha.

Around Kyaikkatha, laterite areas north of the walled site are in active use today. Part of the eastern wall of Kyaikkatha contains a series of laterite cells (Mu-hsoe-ma-gu) associated in local legend with a Khmer princess pining after the local prince who founded the site (Tin Gyi 1931:28) (Fig. 3). To the southeast at Kaw Bein, near Kyaikto, underground networks of tunnels are seen, possibly part of earlier military fortifications. A similar feature, locally called the "Keyhole," is found at the center of the walled site of Zothoke, south of Kelasa Mountain. Other tunnels are found c. 3.2 km north of Kyaikkatha at Natkyizeik, east at Hpaya-tataung, and farther south near Thaton at Mayangon. Trenches such as these could have provided cover for attacking troops and during longer sieges in a manner not unlike later times. For instance, after the British victory at Yangon in 1824 A.D., some 10 km of trenches were documented in areas stretching from Kemmedine to Poojadown (Charney 2004:98).

MOATS AND WALLS

The origins of the enclosing ramparts in Lower Myanmar may also be related to laterite. Given the link between laterite formation and the water table, the variable exposure of the formation at ground level would have influenced relative elevation and thus water pooling. The first ramparts in our view were probably natural ones made by lower-lying land around at least parts of slightly elevated

terrain (Moore 1988). This can be seen, for example, at Little Zothoke (Kyaikhti-saung), where the walled site occupies an irregular islandlike feature surrounded by an inundated band of rice fields. The function of ramparts in Myanmar may have changed in a way similar to that of Iron Age South Asia (c. 700–350 B.C.) sites such as Kausambi, Varanasi, and Pataliputa. These have earth embankments and moats constructed initially for flood control and later modified for defensive purposes (Phasook Indrawooth 2004:133).

Recent chronometric study of moated sites in the Upper Mun basin of northeastern Thailand suggests that many moats there date from the Iron Age but were later filled in. The research also indicated, however, considerable change to the drainage systems, with buried channel features not always expressed in the surface morphology (McGrath and Boyd 2001:349–351). Dates from a series of AMS radiocarbon dates on charcoal and shell taken from the earthworks calibrated to between 0 and 600 A.D. were used to support a rising social complexity in this area by 200 A.D. At some sites, however, such as Ban Non Wat, earlier dates of about 200 B.C. to 0 A.D. were obtained. In addition, McGrath and Boyd's study detected older channels covered over by the expansion of the mound. It should be noted that their analysis was of walled sites in the Upper Mun, not the middle terrace areas to the east in Buriram Province. Thus, while significant, it is not clear if the findings are representative of the whole Mun Valley. Yet this is useful in relation to our Lower Myanmar work in the analogous presence in the Upper Mun of many small and rapidly evolving feeder systems (359–360). Welcome also is McGrath and Boyd's call for more closely relating sites to the palaeolandscape.

KYAIKKATHA

Kyaikkatha was first identified on aerial photographs by Aung Myint in 1976 and verified on the ground in 1981 (Aung Myint 1998:104–105) (Fig. 4). The site occupies a unique position at the mouth of the Sittaung, linking it to Upper Myanmar. To the east is the area of Hpaya Tataung (Malawchaung) or "one thousand pagodas." Kyaikkatha is flanked on the north by the walled site of Sittaung (72 ha, Kyaikkalun Pon Hpaya), one of the 32 *myo* (towns) of the sixteenth century A.D. kingdom of Hanthawaddy. On the southeast is Kaw Htin, protecting the road to Kyaikto, both perhaps having served as sentinel sites for Kyaikkatha. The area within the outermost wall of Kaw Htin is 16 ha, in contrast with the 269 ha enclosed at Kyaikkatha (San Win 1986, 2002).[1] However, both sites have multiple walls and moats enclosing two distinct areas: an inner mound and an outer extension. Thus the number of ramparts does not directly correlate to size, similar to a conclusion reached in a survey of some 60 moated sites in the Central Plain (Mudar 1999). This patterning points to water control rather than defense as a primary function of the man-made constructions, a role borne out by the placement of multiple wall sectors at points of water stress.

Kyaikkatha's inner and outer sets of multiple walls are a combination of earth, laterite blocks, and bricks. The outer walls form an irregular lozenge, 2500 m from east to west and 1000–2000 m north to south. This eastern third of the site is broader and higher, enclosing a partly man-made lake, Ye-leh-kyun, c. 250 m wide and 1000 m long. At the center of the site is a natural hill, 750 m across, with a laterite stupa, Kyaikkanon, on the summit. Kyaikkanon hill is surrounded

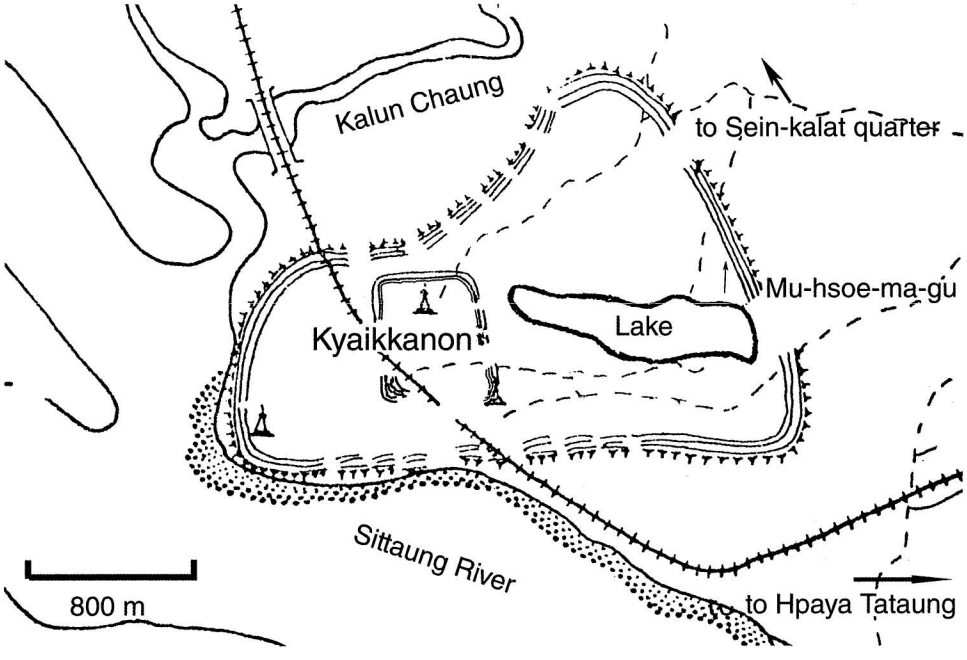

Fig. 4. Plan of Kyaikkatha.

by four to five steep-sided walls separated by moats, each 10–15 m wide. These hug the contours of the natural hill (49.8 m), considerably higher than the Sutaung-pye "wish-fulfilling" pagoda (15 m) just inside the west wall. On the east end of the site just north of the lake is a line of nine undated laterite cells known as Mu-hsoe-ma-gu, noted above. Outside the walls on the northeast is the Sein-kalat quarter, where groundnuts and betel are grown on the higher ground. A number of bifacial gray sandstones and granite polished stone tools 3 to 8 cm in length have been recovered from this area. Many others are kept by villagers who value them for medicinal and protective properties.

Kyaikkatha's walls and moats appear to be carefully placed in relation to the local hydrology and topography. For example, the Kalun Stream on the north and smaller watercourses on the south join the site at the juncture where the outer walls are constructed. The walls were massive, implying considerable labor to construct and maintain them. The five outer walls range from 8 to 21 m in width, with the flanking moats 4 to 17 m wide. The outermost and widest northeastern moat probably reflects efforts to control water flow, as the elevation rises from c. 15 m on the southwest facing the Sittaung River to c. 20 m on the northeast. Just outside the northeast wall, the elevation increases rapidly to c. 50 m, an area of laterite quarries and tunnels of unknown antiquity. Kyaikkatha's embankments on the northeast would have enabled free drainage of lower areas, particularly in times of flood when the lower compartments could act as water basins to reduce inundation levels (Pelzer 1968:275). Hence, wall segments may have been built quickly over a short period of time along different parts of what appears on aerial photographs and maps to be a continuous and complete enclosure.

SILVER COINS AND IMAGES OF THE BUDDHA

During the 1981 survey, a horde of silver coins was found at Kyo Bin Kon Kyaung, a monastery to the southeast of Kyaikkatha. These were decorated with conch or Sankha and Srivatsa motifs and stylistically dated to the fifth century A.D. (Wicks 1992:113). The horde continues to provide a useful chronological marker despite the problems posed by portability. One reason for this is that the use of such coins dies out around the end of the eighth century A.D., and some 400 years elapsed before a coinage was introduced at Bagan (Wicks 1992:139). Similar silver, silver alloy, and occasionally gold coins, found in standard sizes, have been recovered from first millennium A.D. sites in Upper and Lower Myanmar, in central Thailand, and at Oc-eo in the south of Vietnam. The coins have been studied in detail by a number of scholars, with only a few notes on the type found at Kyaikkatha (Gutman 1978; Mitchiner 1990; Wicks 1992).

The design of silver coins was adapted from South Asian pieces—notably of the Andhra region—in the early centuries A.D. and employs a common repertoire of symbols. The four most often seen in Myanmar are the Srivatsa, the Bhaddapitha, the swastika/Rising Sun, and the Sankha or conch. Of these, the Srivatsa and the Rising Sun are the dominant motifs on the obverse of Upper Myanmar coins; a Lower Myanmar type has instead Sankha and Srivatsa motifs, the latter with fertility and water associations. These are sometimes dated to the sixth to seventh century A.D., but others are dated to the early centuries A.D. (Gutman 1978:12–13, 20; Mitchiner 1990:18–19). Sankha and Srivatsa coins similar to those from Kyaikkatha are seen at sites in central and southern Thailand. For instance, small gold coins from Khlong Thom, Krabi, bear a conch and Srivatsa; one coin of this type, along with 13 gold beads of two types and two gold plates, was recorded from Hpaya Tataung (Malawchaung) during the 2000 excavations at Kyaikkatha (Ngwe Ngwe Soe 2001: Fig. 25; Woodward 2003:40). Given the presence of gold mines in the Kyaikkatha region, it is likely that some coins at least may have been produced locally. In some cases, the Lower Myanmar coins are somewhat thicker, smaller, and simpler in design than ones found in Upper Myanmar. For instance, north of Kyaikkatha at Thein Zayat, two thick and slightly curved silver coins (16 mm and 20 mm in diameter) bear a conch on the obverse and an anthropomorphic version of a Srivatsa motif on the reverse (Fig. 5).

Following a survey in 1981, the Department of Archaeology conducted excavations at seven sites within Kyaikkatha. In 1986–1998, five different pits labeled KKT1 to KKT5 were dug; in 2000, units KKT6 and KKT7 were excavated. The Kyaikkatha stratigraphy suggests that many remains are yet to be unearthed, in contrast to cultural deposits in Upper Myanmar that are often virtually at surface level. For example, in the 2000 excavations, six layers were distinguished. The top two were brown humus associated with present habitation (Layer 1, 5 cm thick) and brown soil with no artifacts (Layer 2, 105 cm). The first layer of cultural debris (50 cm) was Layer 3, more than a meter below the ground. This was followed by a further thin layer of habitation debris in yellow soil (Layer 4, 15 cm) and then Layer 5 (30 cm), a black soil without artifacts. At some 2 m below the surface, the basal Layer 6 was identified (Ngwe Ngwe Soe 2001:15). All but one of the pits (KKT7) have been refilled.

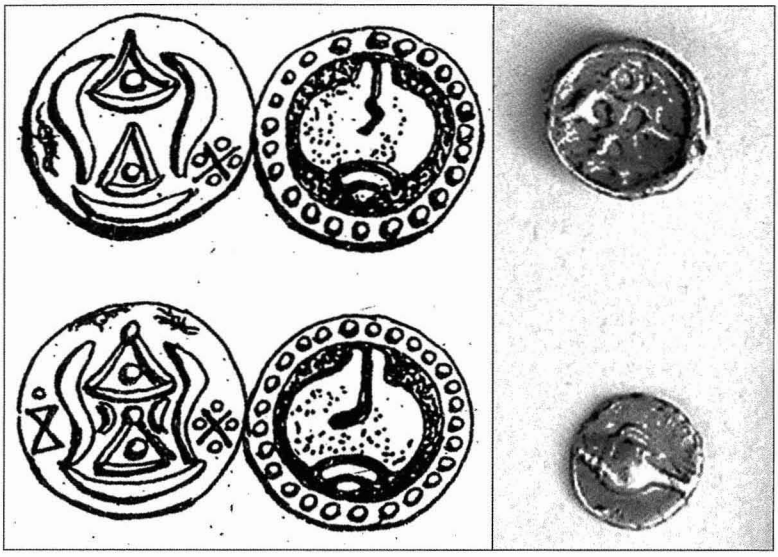

Fig. 5. Kyaikkatha coins (left) and Thein Zayat coins (right).

The structure uncovered at KKT7 is located just west of Kyaikkannon. The building is rectangular, measuring 21.5 m north to south and 40.6 m east to west, with an east entry. The interior contains three large chambers, with a probable platform in the central one, flanked on the north and south by an outer corridor. Along the lower portion of the building's exterior profile, a series of terra-cotta plaques with animal reliefs was found. We return to this type of plaque in discussing Winka; but note the Kyaikkatha examples—not able to be saved in the excavation—as they are the same type as found at Winka, dated to c. the fifth to eighth century A.D. A range of pottery was recovered at KKT7, including a round-bottom water pot (12 cm height) incised with a geometric hatched pattern on the lower portion, several low, wide-mouthed vessels and a number of sherds decorated with incised and impressed linear designs, and others with circular and triangular motifs (Ngwe Ngwe Soe 2001). Surface finds from the compound included blue glass beads, polished stone tools, votive tablets, and a number of grinding stones or mullers akin to those found at Dvaravati sites (Ngwe Ngwe Soe 2001:15; Phasook Indrawooth 2004:134; San Win 2005: Fig. 8).

At Kyo Bin Kon Kyaung, where the horde of silver coins was found, five bronze images of the Buddha were also recovered, although they are now kept at the Don Lan Kyaung or monastery. The images, ranging in height from 15 to 25 cm, may be dated to about the fourteenth century A.D. Three of the images, standing with right hand in the Abhaya Mudra (gesture of fearlessness), broad shoulders and a ribbed belt holding the undergarment, recall images from Haripuñjaya and late Sukhothai (Woodward 1997:123, Figs. 140, 143). In the modeling of the head, strong browline, and nose, as well as the small knobbed *ushnisha,* the closest parallel to two of the images, however, is an undated seated Buddha found near Muang Di pagoda at Twante (Luce 1985:165, Fig. 76d). Also at this monastery is a squat pillarlike stone c. 1 m in height, with a sloping

top on which have been carved four large faces in the style of a *mukhalinga.* The smiling mouths on these recall fourteenth century A.D. Pyinna images of the Buddha, but the carving may be recent as the gold-painted piece is venerated today.

An image of the Buddha was also among finds from Hpaya Tataung, east of Kyaikkatha. The image is made of laterite and although now headless, it measures some 90 cm high. The figure is seated in *pralambanâsana,* with the right hand raised to the chest probably in the Vitarka Mudra, with the left hand resting on the knee. The image is comparable to seated images from Dvaravati sites such as Nakhon Pathom in central Thailand, where they are dated to the seventh or eighth century A.D. (Boisselier 1975:75–82). Other parallels can be seen with a bronze seated image from Beikthano and a stone image from Lemyathna at Sriksetra, dated by San Shwe to the fifth or sixth century A.D. (2006:280, Fig. 26.9). Finally, a distinctive type of votive tablet found at Winka also depicts a seated image (Fig. 6). Generally dated to the seventh century A.D., the tablet (7.6 cm high, 4.5 cm wide) has a square base and arched top, emphasized by three seated meditating figures. The central image, sometimes called a Bodhisattva, is flanked by two attendant figures in a graceful *tribanga* (three bends) posture, with five vessels shown on the foot of the throne. This type of tablet, found at Sriksetra, on the east coast of Thailand, and on the north coast of Java, has been used to note the

Fig. 6. Votive tablet with seated image and attendant figures from Winka.

presence of Mahayanist sects, also probable in Lower Myanmar (Luce 1985: Pl. 58a; Manguin 2006:249, Fig. 23.6; Pattaratorn 1994:125, Fig. 43).

The majority of artifacts from Kyaikkatha stylistically fall within the fifth to eighth centuries A.D., with the seventh century A.D. evidence being the strongest. This does not, however, mean that this was the first phase of habitation at the site—nor the last. We have noted, for instance, current veneration, fourteenth century A.D. bronze images, and polished stone tools. Below we briefly describe another Kyaikkatha find—finger-marked bricks—as these are used within the country as an index of site habitation prior to the ninth to thirteenth centuries A.D., the heyday of Bagan in Upper Myanmar.

FINGER-MARKED BRICKS

Finger-marked bricks have been documented in the walls and structures of Kyaikkatha, as well as surrounding villages (Fig. 7). The bricks are generally large, at Kyaikkatha measuring 37.5–47.5 cm long, 16–21 cm wide, and 8.75–10 cm thick. Laterite blocks from the same site were a comparable length and width but more variable in thickness (7.5–27.5 cm). Not all of the finger-marked bricks are large, with some smaller ones at Kyaikkatha (KKT7) found capping walls (Ngwe Ngwe Soe 2001:11, 15). While used to construct railway beds and rebuild roads, unlike beads and silver coins the bricks are not of interest to collectors and usually remain where they were made.

Fig. 7. Finger-marked bricks at Kaw Htin.

The finger-made impressions may be curvilinear or straight on either end or diagonally across the broad face of the brick and generally were made using one to three fingers of the hand. The patterns are diverse, similar to ones documented in Thailand in the Central Plain and at Phimai in the northeast, where they are dated to approximately the seventh to ninth centuries A.D. (Talbot and Janthed 2001:188). Within Lower Myanmar, finger-marked bricks are commonly in the lower levels of walls and structures and mixed with blocks of laterite. Within Upper Myanmar, they are also seen as ubiquitous markers of first millennium A.D. cultures. It is thought that the custom came overland from South Asia, but equally possible is that it arrived by way of the northeastern coast of South Asia. In Bangladesh, straw or rice is mixed with the lateritic soils in ditches dug around a village. This is allowed to soak for a few days and then formed into blocks that—in conjunction with a mortar made from the clay—are used to build walls (Rahman 2000:218). Along the laterite-rich coast of Lower Myanmar, the rise of brick production may have complemented the use of laterite. The origin of finger marking in South Asia, however, remains unclear. Preliminary survey of Buddhist sites in India and Nepal recorded finger-marked bricks in Bihar (at Kosambi, Rajagriha, and Vaishali), Uttar Pradesh (at Kusinara, Saravasti, and Varanasi [Sarnath]), and at Kapilavastu. In a number of cases, the finger-marked bricks were kept as relics and were believed to have protective power (Win Maung [Tampawaddy] 1991). However, it was not a systematic survey and has not yet been followed up. It does not appear that the markings on the surface of bricks have been remarked upon in a South Asian context. For example, a brick finger marked with three curvilinear lines was included among finds from Dandauli, Saharanpur, in 1935, but it was thickness of the bricks (6–10 cm) that merited comment (Ansari 1938:44). Likewise, in a more recent report on Bogra, the discussion is again on other aspects such as the size of the bricks (Rahman 2000:221–226).

Kelasa Zothoke and Winka

Finger-marked bricks were also recovered from the stupa on Kelasa Mountain. At present, these are one of the few remnants of its earlier habitation, for the stupa continues to be venerated today. The mountain (at 354 m) is an isolated formation located 20 km west of the Sittaung River. It sits on the western flank of a northwest-to-southwest line of ranges extending down the peninsula. Looking west from the mountain, the coast is visible across a stretch of flat paddy fields and streams. Remains of bolts and cables thought to have been left by ships stranded at villages on the foot suggest that it may have been more accessible to the sea than now (Myint Aung 1999:18). However, a comparative study of shoreline change along this part of the peninsula has not to our knowledge been carried out. We are presuming some degree of coastal alteration but question whether the site was ever directly on the shore. A number of small towns are dotted around the base of Kelasa, such as Taung-gyi on the south. However, the main area that has been investigated is on the northwestern side, thought to have been the area called Suvannabhumi in the fifteenth century A.D. inscriptions of King Dhammaceti. According to later Mon chronicles, Suvannabhumi was founded at Thaton and then shifted to Kelasa, where it remained during the reign of ten kings. It then returned to Thaton until relocation to Muttama and the

reign of twelve further kings (San Win 1986). A Mon inscription of the eleventh to twelfth century A.D. ruler Kyanzittha from Myatheindan (Kyaik Talan) stupa at Ayetthema and later records of Dhammaceti mention the site of Taikkala (Golamattikanagara) (Aung Thaw 1972:40). As a result, Ayetthema was the initial site investigated in the 1975–1976 excavations by Myint Aung. However, as we describe below, the work at Winka proved more fruitful. Thus, if there is any basis for the tradition in the inscriptions, Winka may have been the ancient port, with Ayetthema as a guard post. This is also supported by a series of sandstone and granite walls linking Winka to Mya Thabeik on Kelasa (San Win 2002).

Ayetthema — Located on the northwest and north-northwest, respectively, of Kelasa, Ayetthema and Winka village are small even in comparison to other sites in the area. For instance, the early-twentieth-century population of Ayetthema was 1099, only half the 2637 persons recorded at nearby Zothoke (Tin Gyi 1931:110). Ayetthema, north of Winka, is a promontory jutting out from the northwestern side of the mountain. A cutting was made across the north wall of Ayetthema (AYT1), a feature identified on 1958 aerial photographs of the site. It is one of several constructions whose linear outlines are visible on the promontory, thus making our 26 ha measurement of site size provisional. The wall was finished with laterite blocks, but a stratigraphy of more than 2 m was defined. The upper layer (78 cm) was brickbats, under which was a light sandy soil thought to indicate a moat. There was, however, further brick debris in a southern extension of this, and the third layer (1.6 m) was an earlier brick and earth wall. Among the small artifacts recovered were the heads of two clay animal figures identified as bulls. Two potsherds from AYT1 yielded thermoluminescence dates corresponding to 1499 A.D. and 1662 A.D. (Myint Aung 1999:23–24, 53). The results, from Australian National University, demonstrate the continued occupation. However, given the presence of three distinct phases of building for the wall, they are by no means a chronology for the wall or the site. No further excavations have been carried out.

Winka — Following the excavation of the northern Ayetthema wall, Myint Aung shifted work to Winka. Unlike Ayetthema, where excavations were on foothills, the Winka pits were within the village, aligned along Kelasa's lower slope. There are a number of small laterite and brick stupas located along the road stretching north to Ayetthema. Just north of the village, an old stone dam is seen where a major stream empties off the mountain. This is one of several streams watering the rice fields just west of the village. These appear protected from coastal inundation by a linear construction, possibly ancient, but coastal and river change have obliterated clear patterning. Thus our site size of 113 ha, from this linear feature to the base of Kelasa, indicates only the area where brick foundations have been documented. The five structures excavated by Myint Aung, labeled WK1-5, were excavated within the village. WK1 was a 14-room, 20.7 m^2 masonry building located on a mound in the center of the village. The structure showed no entry, although a platform on the east may have supported a wooden staircase, as the exterior on this side showed some evidence of molding. The bricks were comparable in size to those seen at Bagan (40 × 18.75 × 6.25 cm), but four iron nails, a terra-cotta bead with cylindrical grooves, and a spherical carnelian bead suggested an earlier date. Additional spherical carnelian beads were found at WK2 and

WK4. A second structure (WK2), 24.6 m southeast of the first, was rectangular (15.85 × 10.9 m) and oriented north-south, with eight rooms of variable size. The bricks were slightly smaller than those at WKI, but larger bricks were found in the lower layers, laid in a mud mortar. The stratigraphy showed three phases of construction, with structures leveled, the ground filled, and new building taking place at the end of Phase 2. Among the artifacts were two terra-cotta oil lamps, one of red levigated clay, earthen stands, and a flat circular "hopscotch" disc. A carved figure of a seated lion was noted on a laterite slab (45 cm long, 32.5 cm high) (Myint Aung 1999:29–30, 43, 46, 50).

WK3 consisted of a laterite wall and a brick platform with receding terraces. A small (6.8 cm diameter), shallow earthenware oil lamp was found in the second layer of this excavated structure. WK4 failed to expose a building of any recognizable plan, although beads, votive tablets, and potsherds were recovered. WK5 was located west of a laterite stupa known as Kumara (Rajamuni) Zeidi in the northern part of Winka village. This has an octagonal plan, each side with a projecting offering platform. The stupa once had a battlement at the junction of the base and dome made of upright slabs with reliefs. The WK5 structure (18.7 × 16.2 m) unearthed a line of seven rooms along the back wall and five along the front. Although its brick construction was taken to postdate the Kumara stupa, the building's plan and proximity to the stupa suggest a monastery. Other sculptures found nearby included a laterite carving, 45 cm high, of two figures in Anjalimudra under horseshoe-shaped arches (Myint Aung 1999:50). A previously looted mound (WK6) was excavated in the garden of U Po To in the southern part of Winka village. This exposed a square laterite and brick base topped by a cylindrical core. It appeared that the original stupa was later encased by a larger structure. Much of the stupa had been destroyed by vandalism, but fragments of 127 votive tablets were recovered, some similar to types found in Kawgun Cave not seen at sites in Upper Myanmar. The tablets varied in size, from 17.2 cm to 10.4 cm in height, depicting the Buddha seated in the Dhyani Mudra (gesture of contemplation). In some cases, the central image of the Buddha is flanked by similar Buddhas and in others by standing attendants, similar to the other Winka votive tablet described earlier. The main image may be framed by an arch or seated under a five-headed *naga*. Although we have adopted a more conservative dating of the seventh century A.D. for this type of tablet, four of the WK6 examples had Mon inscriptions. These were dated to the sixth century A.D. by Nai Pan Hla based on similarities to tablets from Nakhon Pathom (Myint Aung 1999:53).

The pottery from Ayetthema included both gray and red wares, although only red wares were excavated at Winka. Among these were distinctive spouted vessels with a pouchlike bulge on the neck and four red-slipped necks from sprinkler vessels. The flanged rims on the top of these are similar to ones from Beikthano. The spouts and sprinklers also resemble second to third century A.D. pieces from Yeleswaram near Nagarjunakonda and sixth to ninth century A.D. Dvaravati sites such as U Thong and Kok Charoen. Finally, eight roughly finished tools (5.5–23.3 cm long) made of gabbro, slate, and mica schist were recovered from ground survey during the excavations. Stone tools have also been recovered at Winka, generally bifacial polished axes some 10 cm in length. No radiocarbon dates were obtained, but the pottery, votive tablets, pattern of periodic rebuilding, and plan

of WK5 and WK6 all support occupation during the seventh century A.D., as we suggested for Kyaikkatha. This is also indicated by the pieces we describe below: terra-cotta plaques and architectural elements from Winka village.

Winka Terra-Cottas — The largest number of known terra-cotta plaques come from Kyontu (17°28′N,96°40′E) near Bago, which were photographed in situ in the 1930s (Duroiselle 1938, 1940). They are sometimes seen as influenced by Amaravati styles of the third to fourth centuries A.D. and at others dated to the fifth to sixth centuries A.D. and given a Gupta-influenced attribution (Aung Thwin 2002:35; Duroiselle 1940; Guy 1999:27; Luce 1985:167). As we have seen, similar terra-cottas have been found at Kyaikkatha, with other pieces from Thaton and Winka (San Win 1985:199). While none is an exact match, affinities can be seen with carving on pillars at Amaravati and also plaques from Govinda Bhita (Knox 1992: Pl. 6, 11, 14; Ramachandran 1940). The Myanmar plaques are notable for their spirited scenes of celebration and the manner in which the figures fill the beaded roundels into which they are set. On a plaque from Winka now in the Mawlamyine Museum, two lions are depicted, both with full manes and taut, rounded bodies (Fig. 8). One animal is shown frontally and the other in profile, the mouths drawn back and one paw raised. Lions with similar curled manes are seen in laterite at the Pitaka-taik library structure of the Shwezayan at Thaton and on the outer wall of Zothoke (Luce 1985:162, Pl. 71b, c, 166, Pl. 78c, d). Another piece, 50 cm^2, depicts a peacock. The bird is seen frontally, the tail feathers fanned in an arc behind the head, with wings spread to fill the width

Fig. 8. Terra-cotta plaque with two lions from Winka.

Fig. 9. Corner of terra-cotta plaque from Kyontu.

of the plaque. The head and breast have been damaged, but the large clawed feet remain (Fig. 9).

Other terra-cottas from Winka are equally well made, including several architectural lintel-like pieces of a type not to our knowledge recorded elsewhere. Six sections have been found with the three complete pieces each c. 40 cm in length, 10 cm high, and 15 cm thick (Fig. 10). Each bears two circles filled with a cross-hatch design recalling those on the corners of some of the square plaques. The circles alternate with lozenges filled with bands of beads and lines. Below are triple garlands of pendant flowers. In overall form, although smaller, they resemble Khmer lintels of the seventh century A.D. such as at Sambor Prei Kuk (Boisselier 1966:146, Fig. 33a). Both the roundels and the lions recall ones carved on the brick walls of Sambor Prei Kuk (Briggs 1951:78, Fig. 13; Roveda n.d.). The lintel designs also bear some resemblance to the circle-lozenge motif on Dharmacakra (Dharma wheels), where Khmer parallels are noted as being varied but characteristic generally only in the Prei Kmeng (c. 635–700 A.D.) and late Sambor styles (c. 600–650 A.D.) (Brown 1996:143–148, Figs. 5a, b, c, 58a). To date, no Dharmacakra have been found in Lower Myanmar, although two well-carved laterite circles, each c. 150 cm in diameter and 15 cm thick, are kept at Shan Hpaya in Winka. Each is incised with a circle on the rim and three circles around the center.

Whether the terra-cotta plaques, the "lintel" sections, and the "wheels" are contemporaneous remains conjectural, but placing the range of artifacts within

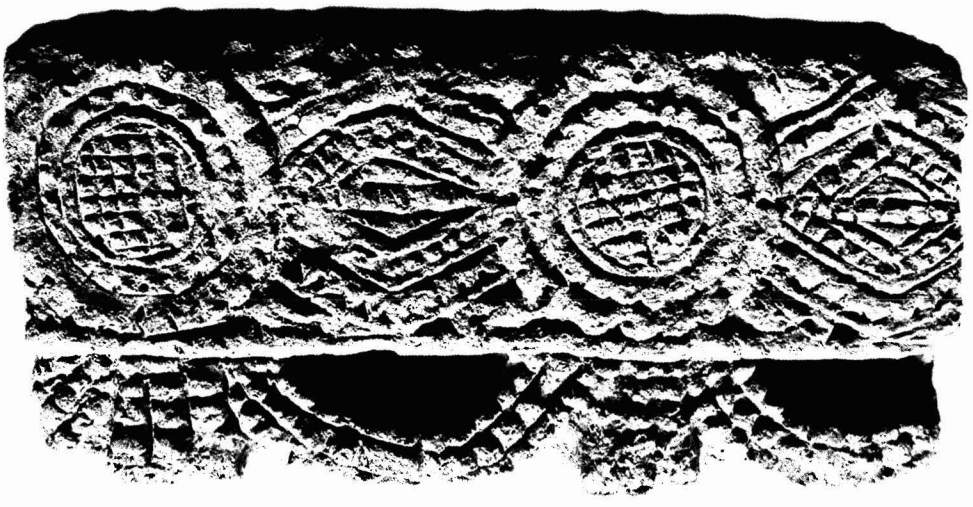

Fig. 10. Terra-cotta architectural section from Winka.

the fifth to ninth centuries A.D. fits with other artifacts recovered from our study area, including votive tablets, stone beads, silver and gold coins, and saddle querns or muller stones (Ngwe Ngwe Soe 2001 : 15; Phasook Indrawooth 2004 : 134; San Win 2005: Fig. 8). The beads, pottery, votive tablets, and stupalike structure (WK6) at Winka, when combined with the terra-cottas and lintel-like piece, leave us with a conservative date of the seventh century A.D. for the majority of the pieces.

Zothoke — Zothoke is a complex walled site, but as it has a venerated stupa, there has been no excavation or full mapping (Fig. 11). We include it here based on the abundant finger-marked bricks and laterite carved wall mentioned earlier. Two sites are found in this area, commonly called Little Zothoke (Kyaikhtisaung) and Big Zothoke (Ywagyi) (Moore and Aung Myint 1991: Map 12). The walled area once probably enclosed both, reflected in our figure of 182 ha for the area within the outer Little Zothoke (Kyaikhtisaung) wall. The remaining sector, the 2.25 m high Hsindat-Myindat laterite wall, is only the segment 100 m long that we noted earlier. The wall crosses the tip of the mound where it meets the Zothoke Chaung or stream. An earthen rampart backs it on the north side, and a tank is seen in this area today. A double wall with rounded corners surrounds the smaller area, c. 21 ha, of Big Zothoke. An inner rectangular enclosure is seen around a rectangular ordination hall renovated in 2001. Little Zothoke (Kyaikhtisaung) is an irregular site sloping to lower land and a village on the west. As at Kyaikkatha, the greatest number of walls—in places seven—are on the higher northeastern portion of the site. Two stupas, the main Kyaikhtisaung and the Naungdawgyi, are located on the low interior hill (Luce 1985 : 160–161, Pl. 67–69). The foundation of Kyaikhtisaung is laterite, with some blocks measuring 60 cm long, 45 cm high, and 30 cm wide (Aung Thaw 1972 : 40).

Other sites where finger-marked bricks have been found are located to the southeast, all aligned with Kelasa and Zothoke. These stupas have a variety of

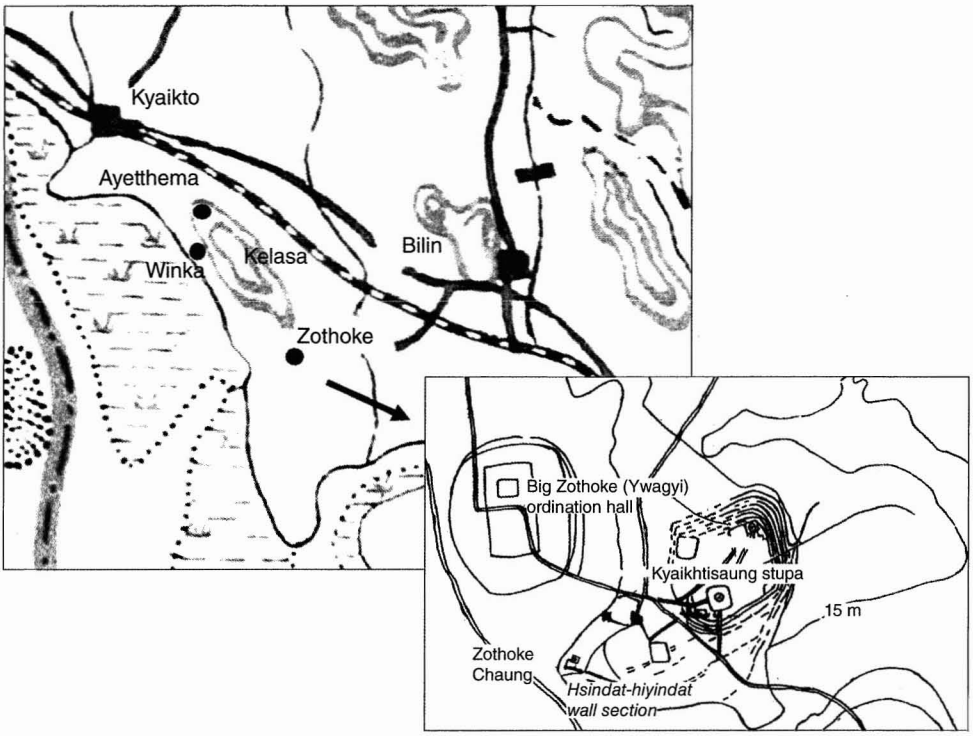

Fig. 11. Plan of Zothoke.

laterite constructions and reliefs such as lions and *deva*. The closest to Zothoke is Manimekhala at Zwekala, with others at Waingpat and Muthin. Southeast of Muthin is Moat-soe-ma-kon (Kakatit), a small oval or footprint-shaped site of c. 12 ha within the outer wall, with up to five earthworks and moats in parts (San Win 2005a: Fig. 9). Kakatit, like all the Kelasa sites, is a slightly elevated remnant of the underlying laterite formation. Like Kyaikkatha, the earthworks and moats have yet to be dated. As with the others, however, the multiple walls suggest repeated construction, particularly on the higher northeastern side of the mound in order to channel water flow to the lower portions of the periphery. We noted this at Kyaikkatha, where the slope of the site means a drop of some 12 m from the northeastern corner to the southwestern one on the Sittaung. However, the slope is less around the foot of Kelasa Mountain, so at Zothoke, for example, the elevation drops only 7 m from the northeastern high point to the low on the southwest.

Thaton Topography and Hydrology

The linear topography of Thaton differs from the curvilinear landforms of the Kelasa and Kyaikkatha areas (Fig. 12). As a result, the walled area of Thaton is a long rectangle (259 ha, 2010 m north to south, 1290 m east to west). The form of the site is similar to that of Halin in Upper Myanmar, for as noted in an 1897 account, the corners are not right angles (*British Burma Gazetteer* 1897:715). The

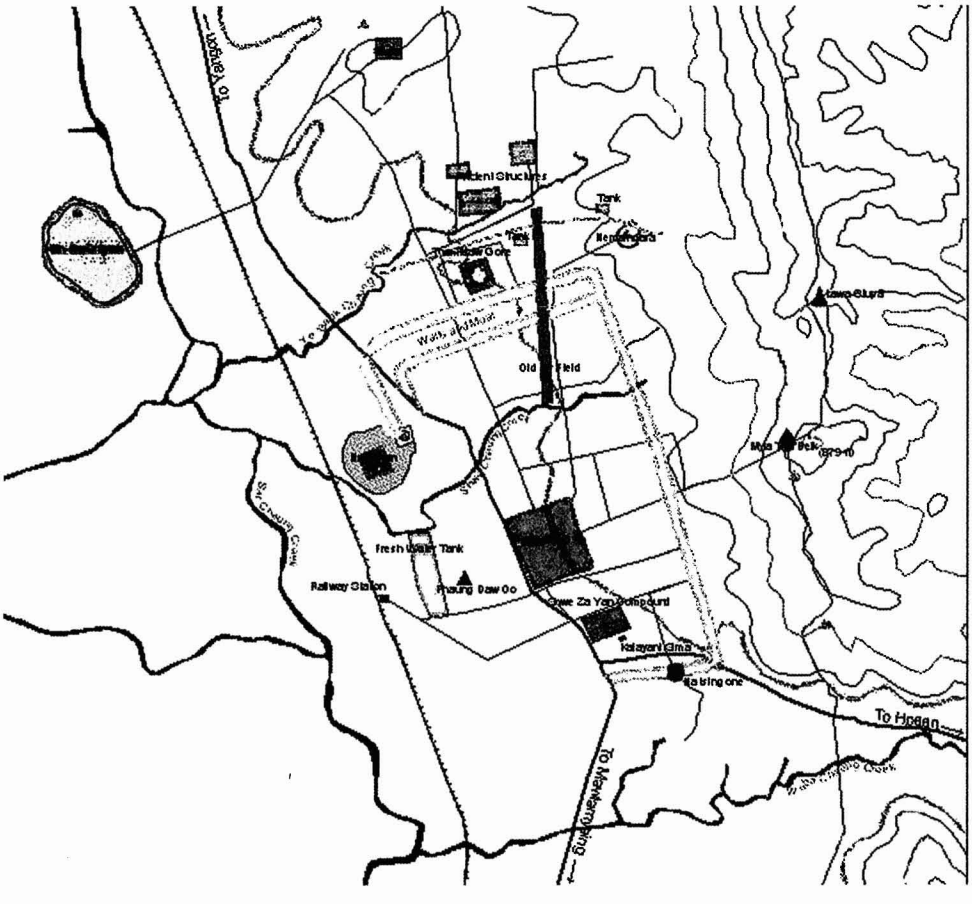

Fig. 12. Plan of Thaton.

most commonly reproduced map of Thaton shows it as simple rectangular form, but on the northeast and southeast, five and three to four rounded corner walls, respectively, work to draw water off from streams flowing down from peaks on the escarpment (Aung Thaw 1972:35; Luce 1969:24; Moore and Aung Myint 1991:94, Map 9; Thin Gyi 1958). Thus, despite the contrasting topography, the same principle of water management noted at Kyaikkatha and Kelasa holds: The walls and moats are carefully placed to control water at the most critical junctures, ones defined by the local topography and hydrology. In the case of Thaton, local elevation falls considerably—over 150 m from the crest of the Martaban Range to the eastern wall of the site. The walls are sizeable, the inner wall on the northeast, for instance, being 15 m wide. The slope across the site east to west remains notable, from the higher northeast (43 m) to some 9 m on the southwestern corner. On the west, Thaton faces the coast, with the walled area filling a fanlike sector along the foot of the long mountain spur. This parallels a fault line along which the rail line runs. Just south of Thaton, the range opens to form a valley 20 km long, with Zingyaik Mountain (269 m) at the north and passageway to Pa-an,

then south over the Three Pagoda Pass to central Thailand. When seen in its geographic setting, the location of Thaton is clear, its multiple walls and moats channeling water from the hills on the east and preventing flooding from the sea on the west. Protection from coastal inundation is aided by the natural topography, for seven of the eight low hills forming a circular arc around the walled city are located on the west and south where the terrain lies open to both the shore and the road to the east.[2] Most of these hills today are associated with local spirit beliefs; only at Neimindara (55.2 m) on the northeast is this mixed with a perception of its strategic value, as in precannon times it is said that the troops that held this hill controled the city (Aung Myo, pers. comm., April 2005).

Within the southern area of Thaton today, numerous monasteries of unknown antiquity cluster around the reputedly old palace site and main stupa, the Shwezayan. This is traditionally dated to the time of the Buddha and more conservatively to the fifth century A.D. (Tin Gyi 1931:24). A number of contemporary sluice works, monasteries, and remains of old forts and newer camps mark the Gawt and Waba Streams on the south. Thaton is an administrative center, unlike the small villages at Kyaikkatha and around Kelasa. This is not a recent development, with considerable renovation having taken place in the early twentieth century A.D. At Shwezayan, for instance, patronage during this time supported reconstruction of the entire platform. At Thagya Hpaya, a laterite library on the stupa platform, terra-cotta plaques with reliefs of the *Jataka* tales appear in our opinion to predate a series of similar eleventh-century A.D. reliefs at Bagan. However, these have been renovated many times so that today they are covered with a thick whitewashed coating. Combined with its continued role as a pilgrimage center, detecting its first-millennium A.D. remains is extremely difficult. There has been only one preliminary excavation carried out at Thaton in recent years, a small pit near the eastern wall, which yielded a few potsherds (Baby 2000). That Thaton had walls during the first millennium A.D. is seen in the abundant distribution of large bricks, many finger marked, in the lower layers of the current city wall. Prehistoric habitation in the area is also seen in the finds from Hsinbyukyun and Mayangon that we describe below.

The earliest known historical piece within Thaton is a bronze image of the Buddha (30 cm) in a standing position, the body curved in a light *tribanga* posture. The image was found at Kyet-tu-ywe-Thaung village some 24 km east of Thaton and is now kept at the Nandawya Kyaung Taik in Thaton. Similar images, attributed to the second to the fifth centuries A.D., have been noted in Thailand—one from Pong Tûk and one from Nakhon Ratchasima (Boisselier 1975:69; Dupont 1959:92, Pl. 336–337, 165; Le May 1962 [1938]: Pl. 3, 4). Reliefs dated to the ninth to eleventh centuries A.D. have also been found at Thaton, notably two slabs of reddish sandstone. Each over a meter in height, these are carved with images of Vishnu reclining on the serpent Ananta. Figures of Brahma, Vishnu, and Shiva are seated on three lotus stems rising from his navel. Another sculpture found at Thaton depicts a four-armed seated figure of Shiva, a 1.2 m relief, with his bull Nandi shown below the right leg and the buffalo demon under his left knee (Luce 1985:170–171, Pl. 88–90).

Just south of the Shwezayan stupa compound is the Kalyani Thein or ordination hall, which has been repeatedly renovated. The Kalyani *sema* are pillar-shaped boundary stones over a meter in height, carved with events from the life

of the historical Buddha and other scenes. These are on a central panel with floral carvings on the apex and in bands on the lower part of the stones. They are somewhat similar to Dvaravati *sema* from northeastern Thailand generally dated to the sixth to ninth centuries A.D. However, various forms of the Kalyani *sema* are distinct. They are often linked to twelfth to thirteen century A.D.. Mon migrations from the northern Thailand kingdom of Haripuñjaya, when the population is said to have fled a cholera epidemic or Khmer incursions. However, given the legendary basis of this and the absence of a full comparative study of the stones, it would seem best to leave open the question of their date (Phasook Indrawooth 1998:117). Dates can be gleaned from a horde of votive tablets found in recent years at a high school in the palace precinct. These and other tablets from Mudon Township are housed at the Shwezayan pagoda, other Thaton monasteries, and the Mawlamyine (Moulmein) Museum. Among them are Bagan period pieces depicting episodes of the life of the Buddha, as well as a number of earlier types with *makaras*, stupas, images of the Buddha seated and in the European posture, and Bodhisattvas akin to those found at Sriksetra and Nakhon Pathom. There are also a number of similar tablets found further south on the peninsula at sites on both the west coast such as Dawei and Krabi and east coast sites such as Yarang. We also noted earlier the horde of 127 tablets from Winka (WK6), with some dated palaeographically to the sixth century A.D. (Luce 1985: Pl. 56g, 58a, d, 61a, e, f; Myint Aung 1999:53; Pattaratorn 1994:120–121, 520, Figs. 29, 42, 43, 2000:183; U Mya 1966: Pl. 10, 11, 17, 18). The only tablets with provenance are those from the high school—reportedly found during digging for a latrine—but the depth of the finds was not recorded. These problems also plague the prehistoric finds we describe below.

MAYANGON AND HSINBYUKYUN ARTIFACTS

The western lowlands between Thaton and the coast are populated today, with continued construction of water control devices to reclaim land in this zone. One example of this is provided by Mayangon, located 11.6 km northwest of Thaton. There, the new Mayangon sluice gate, with 15 valves measuring 1.8 by 3.6 m, will reclaim 10,000 acres of wetland (*New Light of Myanmar* 2006). Survey last year of a small part of the canal for the sluice by San Win's research team produced documentation of more than 100 stone tools and rings as well as incised pottery (Figs. 13 and 14). All the finds were made just west of Mayangon village, located on an oval-shaped mound c. 450 m from north to south and 365 m east to west. The pottery included sherds with wavelike and criss-cross designs similar to pieces from Sanpannagon (16°15′N,97°20′E) some 30 km south of Thaton (San Win 1986:167, 182, Fig. 15). In central Thailand, these types of rings and pottery are seen at a range of sites, including Ban Kao, Kok Pleb, and Nong Nor around the Gulf of Thailand and somewhat to the north, Ban Ku Muang, Amphoe Inburi, and Changwat Singburi (Higham and Thosarat 1998; Phasook Indrawooth 1985:53, Figs. 17–21). Of the five rings, two complete, four were made from slate and one from a fine-grained quartzite. The stone tools included adze/axes, scrapers, and sickles made from fine-grained and epidote quartzite, slate, microgranite, sandstone (graywackes), fine-grained sandstone, indurated mudstone, siltstone, and rhyolite porphyry.[3]

Fig. 13. Stone rings from Mayangon; complete ring 10.5 cm outer diameter, hole 6.0 cm.

Polished stone tools were also among finds from a survey by the authors in 2004 of Hsinbyukyun (450 × 350 m). The mound is similar in size to Mayangon but located just northwest of the northwestern corner of the Thaton walled enclosure. It is enclosed by remnants of two ramparts, from which we recorded a number of finger-marked bricks. Other finds from Hsinbyukyun include carnelian and crystal beads, with the evidence as a whole supporting a profile of Iron Age or earlier habitation in the lowland zone lying between Thaton and the coast. The stone tools were different in shape and material from those at Mayangon and included a bluish white triangular piece (3 × 3 cm), a longer wedgelike brownish orange (5 × 3 cm) and a rectangular black tool (6 × 3 cm) (Fig. 15). There were also thick black pottery sherds with designs separated by horizontal lines. One sherd (5 × 7 cm) had three horizontal rows of different designs: x-patterns impressed with a pointed tool, wider starlike motifs, and a deeply incised horizontal row of flared v-shaped motifs. A similar x-patterning is seen on black sherds from Donwun (17°08′N,97°01′E), a multiple-walled site on the east bank of the Bilin River c. 22 km north of Hsinbyukyun. There, the incisions are bordered by multiple horizontally incised bands. Other black as well as orange sherds from Donwun have incised undulating patterns of multiple lines enclosed by sev-

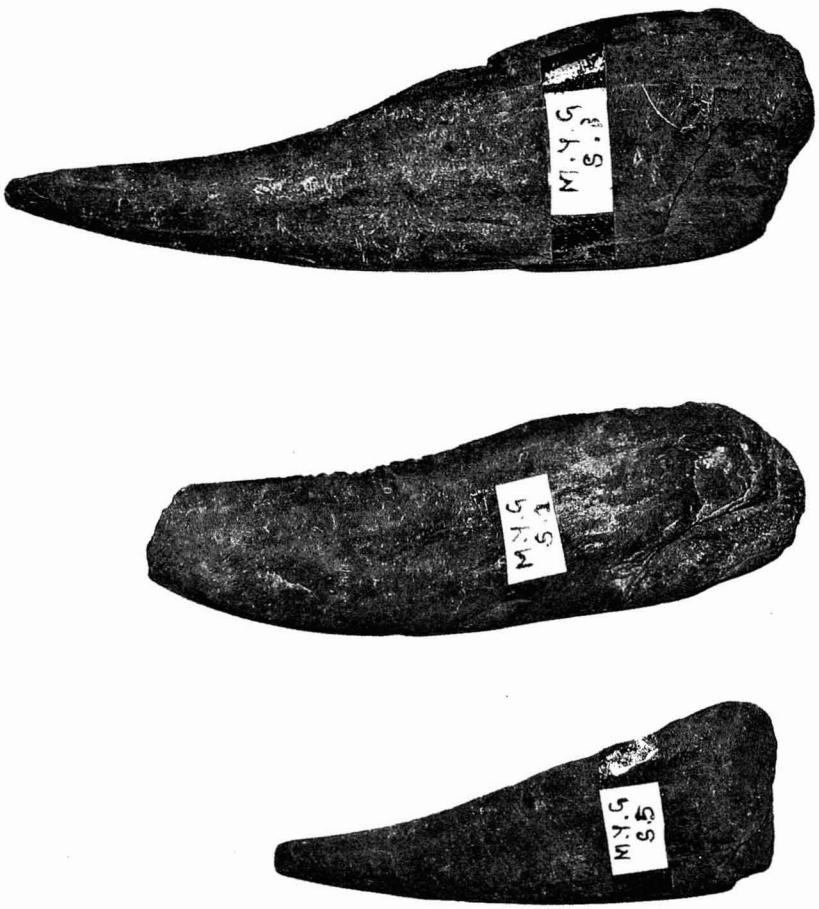

Fig. 14. Stone tools from Mayangon; top to bottom 15.5, 13.0, 10.2 cm in length.

eral straight horizontal lines (Fig. 16). Like Hsinbyukyun, Donwun survey yielded finger-marked bricks, concentrated around the octagonal laterite stupa at the site. A crowned figure (c. 43 cm in height), carved in relief on a stone slab kept near the stupa, stylistically recalls stucco reliefs from Nakhon Pathom in central Thailand dated to c. the sixth to ninth centuries A.D.

The patterns and horizontal ordering of rows on the Hsinbyukyun sherds are similar to two orange sherds recovered c. 50 cm below ground level from a cave just south of the walled city of Tanintharyi south of Myeik. On the Tanintharyi pieces, however, each incised motif is enclosed by a square line with the row flanked above and below by rows of triangular impressions. A stone mold (8 × 10 cm), probably for casting a metal ornament, was found from the same cave (Fig. 17). The masklike oblong design (5 × 8 cm) inscribed on the piece is framed with a row of dots, with the two large circular eyes and mouth. The Tanintharyi pieces, undated and from further south, share the problems of provenance and stratigraphy we noted earlier, with the lack of context leaving our conclusions

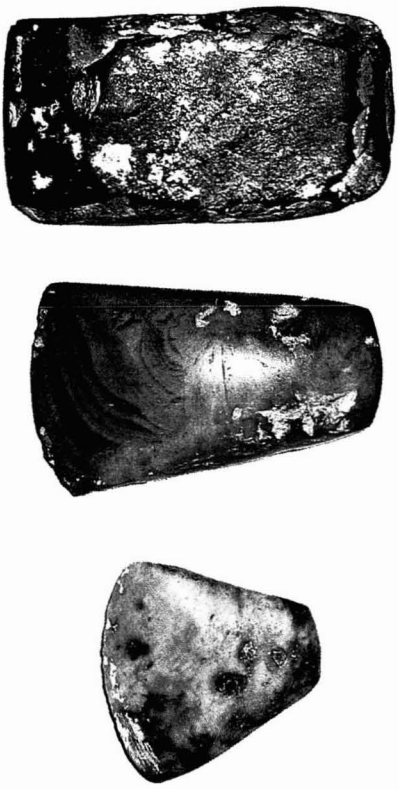

Fig. 15. Stone tools from Hsinbyukyun; top to bottom 6.5, 6, 3.5 cm in length.

Fig. 16. Pottery sherds from Donwun.

Fig. 17. Stone mold found south of Tanintharyi.

general. We include them in our report, however, for they provide an important reminder of earlier habitation all along the Lower Myanmar peninsula.

CONCLUSION

Kyaikkatha, Kelasa, and Thaton illustrate the complementary relationship of Lower Myanmar sites to each other and other regions. The mouth of the Sittaung where Kyaikkatha is located is at the protected apex of the Gulf of Muttama, while Kelasa and Thaton are on the edge of higher ground. All three sites, however, are more elevated on the east, tilting down to alluvium and the Andaman Sea on the west. Each would have had trading advantages: Kyaikkatha with the interior and areas west, Kelasa along the coast, and Thaton for passage to the east. A framework of landscape modification, coastal diversity, and of reciprocal shore, maritime, and land routes considers processes of change at different scales. At one level, they are adaptations of natural norms, well-engineered efforts to control

water stress from flooding and saltwater inundation. Thus the construction time represented by a pattern of five to seven 15 m earthworks flanking part of a site may have been brief—a quick response to immediate need. At another level, they express keen awareness of the local terrain, not as a static entity but as a framework for interaction (Blom et al. 2003; Evans and Farr in press). This sense of the land and man's presence is immediately felt on entering the domain of Kyaikkatha, Zothoke, and Thaton. Particularly at Kyaikkatha, it becomes increasingly palpable as one moves over the ramparts, labors through the thick vegetation covering walls and moats, and enters the inner core of the walled domain. The impression is derived not only from surmounting each wall but also by the shifting visibility of these in relation to other built elements within the walls and natural landmarks outside the site. Often these are of striking beauty, such as the blue ridge of Kyaiktiyoe stupa east of Kyaikkatha. Despite the natural and man-induced degradation of the walls, the perception of being within or without the boundaries is immediately felt. This is quite different from entering walled sites such as Beikthano or Sriksetra, where in the dry flat terrain of Upper Myanmar it is easy to miss crossing the ramparts. Once within, the only orientation is to man-made elements, such as the Bawbawgyi stupa from the palace at Sriksetra. We need more evidence to confirm or amend our hypotheses, not least due to local hydrological change over the last 2000 years. Working from the specific to the general, however, a model drawing in artifacts, sites, and ecology begins to structure data in ways open to future expansion.

NOTES

1. The area within the outermost wall was measured from aerial photographs of the late 1950s and 1980s.
2. The hills are Neimindara, Thamidawgon, Hsinphyukyawn, Natkyawn, Phaungdawoo, Nandaw (palace), Shwezayan stupa, and Nathsingon. Popular belief today notes that Thaton is protected by the bones or blood of Byattwi, except on the southeast, where the eleventh-century A.D. king Anawrahta is said to have entered to take the city. Among the images of nats or spirits on the southeast Nathsingon hill are thus many of Byattwi and Byatta, the Tanintharyi nats, two brothers said to be foreigners shipwrecked off the Tanintharyi coast.
3. Test carried out for San Win's team by the Department of Geology, University of Yangon, April 2006.

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ABSTRACT

The high rainfall of the Lower Myanmar coast is balanced by the aridity of the country's inland plains. The article profiles three sites in a laterite-rich area located in the northern part of the Lower Myanmar peninsula. The walls and moats of these sites underline their role in water management, one where control of water was the decisive catalyst. The sites of Kyaikkatha, Kelasa, and Winka illustrate how slight changes in topography signal critical junctures, the points where walls and moats were constructed. As a result, up to seven walls flank the higher edges of these sites; these protected the interior by diverting excess water to lower areas. Using large finger-marked bricks and terra-cotta artifacts such as votive tablets, plaques, and architectural elements, a broad chronology of c. the sixth to ninth centuries A.D. is proposed, although a majority of the pieces dated to the seventh century A.D. Attention is also drawn to evidence of Lower Myanmar prehistoric habitation in lowland areas close to the coast, where natural and man-made changes continue to alter the ecology and affect archaeological interpretation. The survey is used to encourage comparative studies, drawing in environmentally diverse but culturally related areas of South and Southeast Asia. KEYWORDS: Myanmar (Burma), ecology, laterite, water control, hydrology, Iron Age, Buddhism.